

THE COURTSHIP DANCE AND SLEEPING HABITS OF *SCOLIA DUBIA*.

BY PHIL RAU, Kirkwood, Mo.

A colony of these wasps was discovered in late summer on a city lot. Previous experience had led us to expect these insects only in the latter part of August.¹ They were actively flying about a neighborhood dump where rotting vegetation, barn refuse, tin cans and broken pottery lay in rank heaps. This dump was in a thirty-acre field, but a careful check showed wasps in only this one spot, a space of about a dozen square yards. Obviously, the decaying matter contained their hosts. A superficial scratching of this pile revealed thousands of larval green June beetles, *Cotinus nitida*. These were at various depths in the heaps, and often a round hole in the manure led to a larva. In June many adult beetles had been seen flying about these heaps, but were not seen elsewhere in the field. Now if these back-crawler larvae were the prey of the wasps, the latter could hardly have come earlier and gotten prey sufficiently large to feed their young.

The surfaces of some of the piles were heaving like ocean waves; a slight kick with the foot at such places would expose dozens of surprised larvae. About these mounds hovered many low-flying *S. dubia* wasps, conspicuous by their red, yellow and black abdomens. During the early part of their lives, this low flight was a courtship dance in which both sexes took part. On September 3, a rainy morning, this courtship dance was observed from 8 to 10 a. m. Six adjacent mounds of manure and rubbish were their chosen "dance platforms." There were by this time (about four days after their first appearance) about 150 wasps scattered over the small area. Possibly the females had come upon the scene suddenly, a little later than the males, as happens in many species of wasps. I was unable to distinguish the sexes at a glance when they were young.

The slow flight was performed in a horizontal plane three or four inches, and never more than twelve inches, above the ground. They glided smoothly in and out the maze, wheeling in figures S's and 8's for hours at a time. Presently one of them would leave the flight, alight on the mound, fold her black wings

¹ Wasp Studies Afield, pp. 129-132, 1918.

over her bright abdomen and immediately become inconspicuous against the dark background. Thus they rested quietly, often for several minutes, while the dance went merrily on over their heads. Suddenly the one resting would spread the black wings wide open, revealing the brilliantly colored body, and almost immediately one of several would swoop down from the dance and attempt or consummate a mating. The union is almost instantaneous, although it may be prolonged by the confusion. In the majority of cases, the visitor merely bumped the resting one; approximately fifty bumps occurred to one actual mating. I do not know if they were unable to distinguish the opposite sex from a short distance, or if these attempts were merely a part of the courtship play. No such behavior occurred while they were on the wing, but the display of color of the resting wasps seemed unfailingly to elicit this reaction. It seemed that this spreading of the wings was no mere accident. One would almost say, to see the process, that it was deliberately and coquettishly done. When the wasp alighted, with the wings closed and the bright colors hidden, the creature was almost invisible. After a few minutes, the wings were slowly spread apart and it appeared that the wasp was preparing for flight into the air. In that, we were deluded, however, for with her wings spread, she would quietly sit and wait, but for only a brief time. So attuned were they to the expectation of being attacked while resting with the wings open that they would not move at the approach of one's fingers or forceps, and they could be picked up by the dozens without difficulty. So great was their expectation that one could approach quickly or slowly, dangle the forceps above them and give them ample warning without arousing them to the least response.

A week later, the wasps were still more numerous, and they were behaving about the mounds in the same way. The excess population were even going through the maneuvers along the pathway near the mounds. From early morning until late afternoon they danced, and matings occurred more frequently with rivalry among the males. By this time the large size of the abdomens of the females indicated that the ova were reaching maturity and soon egg-laying would begin.

During this courtship period, both sexes slept on the plants near-by, but later in their lives, they crept into the earth under the rubbish to spend the night. They were up bright and early on pleasant days, but on cloudy days they often remained in sleep

until a late hour. One rainy morning, they were observed to sleep until 10.30 a. m. Sometimes they were alone on the vegetation, but more frequently they were in groups of from two to ten or even twenty, huddled together irregularly among the unripe seed-clusters of lamb's-quarter. In the center of one such group of ten, one wasp, *Priononyx atratum*, was found fast asleep. When *Scolia dubia* slept, she did not assume the pose common among *Ammophila* wasps (clinging to the stem with the mandibles, with the body horizontal and legs hanging free), but she lightly rested with all six feet on the surface.

The most interesting point in this sleeping behavior is that there seemed to be a clear-cut dividing line in their choice of sleeping quarters, probably determined by the ending of courtship and mating. In early life they slept in the vegetation; after mating they crept into the manure-heaps. This was not due merely to the colder weather in the later period, because in cages in the house they behaved in the same way. Twenty wasps kept in cages climbed over the leaves and sipped honey during the day, but at night all crept under the earth at the bottom of the cage. In one cage with a wooden bottom, they always crept under a scrap of paper on the floor. September 12 seemed near the dividing line between their juvenile and adult life.

On September 18, when the place was again visited, only about a dozen *Scolia* were to be seen above the mounds, and their demeanor was entirely different. They nervously walked about, occasionally stopping to examine a clod, and soon entered the ground head first and disappeared from view. Just below the surface were hundreds of beetle larvae, but most of them were active, and on the quiet ones I failed to find any wasp eggs. For several days thereafter the spot was watched, and the wasps continued to come, in small numbers, until September 23.

Fabre succeeded in getting *Scolia* wasps to sting the beetle larvae in the confines of a bell-jar. Of the many that I placed in cages, only one wasp stung the larva, and this seemed only the result of being irritated, because it got in her way. The writhing of the larva caused the wasp to turn somersaults while she was clinging to her prey, and finally she turned it over and stung it under the mouth. A large drop of black juice oozed out at the point of the sting, and the larva stretched out as if dead, but it subsequently passed pellets of excrement and the next day it moved the legs feebly. Probably the reason I did not get so abun-

dant a stinging response, as did Fabre, was that the date of my experiments did not coincide with the period of oviposition, when the wasp would have been in psychological as well as physiological condition for this reaction.

KOW-TOWING TO THE GENERAL ZOOLOGIST.

BY J. D. GUNDER, Pasadena, Calif.

Being the first of a series of short illustrated articles upon subjects of interest to entomologists, we introduce to you, for convenience of portrayal and interpretation, our personified character, Dr. TOM, otherwise known as Dr. E. N. TOM OLOGY. Dr. Tom may represent you or me or all entomologists in general, but we leave that to the discretion of the majority.

In the picture opposite Dr. Tom thinks that our science, Entomology, is getting "growed-up" and that in the future we should have more representation in Zoölogical circles, more than we have at present. In fact he is tired of "kow-towing" and he has heard it hinted that the book of "Rules" should be revised to take more recognized cognizance of the scientific findings in the world of the insects. But the trouble is that some folks think that insects won't ever go well with jellyfish and elephants. Maybe they are right—under the present conglomerate régime. Is it possible that united entomological groups may eventually have to "cut certain foreign fetters" and have separate rules? In the meantime Dr. Tom should make an effort to use the "committee wand," if opportunity presents. Did you notice the short and evidently impromptu note upon entomological kowtowing by H. J. Turner in the May, 1931, Record and Journal of Variation, page 91? Of late years there seems to be something radically right with some of our beloved radicals. That's a friendly pat on the back! But the question still remains—Is it possible in this age of specialization to rejuvenate for future need an authority which specialization is making antiquated?